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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,992	10/30/2003	Kunihiko Takao	500.43232X00	5669

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MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.
1800 DIAGONAL ROAD
SUITE 370
ALEXANDRIA, VA 22314

EXAMINER

HAMO, PATRICK

ART UNIT	PAPER NUMBER
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3746

MAIL DATE	DELIVERY MODE
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07/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/695,992

Applicant(s)

TAKAO ET AL.

Examiner

Patrick Hamo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4-7,9 and 11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4-7,9 and 11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers.

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

This action is in response to amendments filed April 23, 2007.

Claim Objections

Claim 11 is objected to because of the following informalities: the terms "when the" are repeated on line 10 of the claim in what appears to be a typographical error. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 4-6 and 11 are rejected under 35 U.S.C. 102(b) as being anticipated by Bez, Pat. No. 5,482,443.

Bez discloses a pump including a pump cylinder 53 having an inner wall surface 70 and a piston 42 reciprocating in the cylinder, the piston being formed on its outer surface with a stepped part 74 along the driving direction of the piston so as to define a working chamber having a cross-sectional area between the stepped part 74 and the inner wall surface 70 of the cylinder (stage 3, fig. 4), and the end part of the piston 42 on the side remote from the drive side exposed to a gas atmosphere (col. 4, ll. 60-67). It is

inherent that its cross-sectional area and the driving speed of the piston determine the flow rate out of this working chamber. The pump includes another pump cylinder 51 with a piston 72 reciprocating in it, a suction valve 100 with a one-way check valve 103 upstream of this pump cylinder, the one-way being directed from the upstream into the upstream-side pumping chamber, therefore preventing flow when the piston moves forward to pressurize the liquid in the chamber, and allowing flow when the piston moves backward to draw liquid into the chamber, and a discharge valve 55 with one-way valve 108 downstream of the first pump cylinder but upstream of the second (see fig. 6), the one-way being directed from the upstream side chamber towards the downstream side chamber such that it prevents flow when the upstream piston moves backward and allowing flow when it moves forward. Pump cylinder 53 is located farthest downstream of three pumps provided. The working chamber of pump cylinder 53 is connected to a discharge passage 142 out of the pumping assembly and the working chamber of pump cylinder 51 is connected to an intake or suction passage 92, and pump cylinders 51 and 53 are connected in series (stages 1 and 3, fig. 10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiyama et al., 6,122,049 in view of Bez, 5,482,443, and further in view of Gerhardt et al., 6,712,587.

Sugiyama teaches a liquid chromatographic apparatus including a reservoir 10, 12, 62, a low pressure pump 20, 22 provided between the reservoir and a pump 34 for providing eluent to a column 42, a switch valve 38, a passage communicating the switch valve 38 to the column 42 and a passage communicating to reservoir 62 (fig. 1), the switch valve changing over communication between the two passages.

However, Sugiyama does not teach the following taught by Bez: a pump including a pump cylinder 53 having an inner wall surface 70 and a piston 42 reciprocating in the cylinder, the piston being formed on its outer surface with a stepped part 74 along the driving direction of the piston so as to define a working chamber having a cross-sectional area between the stepped part 74 and the inner wall surface 70 of the cylinder (stage 3, fig. 4), and the end part of the piston 42 on the side remote from the drive side exposed to a gas atmosphere via chambers 46 and 48, as seen in fig. 1 (col. 4, ll. 60-67). It is inherent that its cross-sectional area and the driving speed of the piston determine the flow rate out of this working chamber. The pump includes another pump cylinder 51 with a piston 72 reciprocating in it, a suction valve 100 with a one-way check valve 103 upstream of this pump cylinder, the one-way being directed from the upstream into the upstream-side pumping chamber, therefore preventing flow when the piston moves forward to pressurize the liquid in the chamber, and allowing flow when the piston moves backward to draw liquid into the chamber, and a discharge

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valve 55 with one-way valve 108 downstream of the first pump cylinder but upstream of the second (see fig. 6), the one-way being directed from the upstream side chamber towards the downstream side chamber such that it prevents flow when the upstream piston moves backward and allowing flow when it moves forward. Pump cylinder 53 is located farthest downstream of three pumps provided. The working chamber of pump cylinder 53 is connected to a discharge passage 142 out of the pumping assembly and the working chamber of pump cylinder 51 is connected to an intake or suction passage 92, and pump cylinders 51 and 53 are connected in series (stages 1 and 3, fig. 10).

Furthermore, neither Sugiyama nor Bez teach the following taught by Gerhardt: a pump for liquid chromatography wherein a liquid flow rate is in the $\mu\text{L}/\text{min}$ range, particularly 1 $\mu\text{L}/\text{min}$ or less (col. 1, ll. 57-60) that is reliable and uses off-the-shelf technology (col. 2, ll. 4-12).

Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified Sugiyama with Bez and Gerhardt in order to prevent leakage of atmospheric pressure air into the working parts of the pump (Bez, col. 2, ll. 44-56) and make it more reliable and use off-the-shelf technology (Gerhardt, col. 2, ll. 4-12).

Furthermore, the claimed ranges of 0.1 nL/min to 50 $\mu\text{L}/\text{min}$ overlaps the range taught by Gerhardt and therefore fails to patentably distinguish over the prior art. See MPEP §2144.05(1).

Response to Arguments

Applicant's arguments filed April 23, 2007 have been fully considered but they are not persuasive. The applicant asserts that the limitations of claims 4 and 11 are not anticipated by the references. However, as explained in detail above, the prior art of Bez anticipates both of these claims. The rejection of claim 4 under Bez has been revised to more clearly point out how the claim is anticipated, but the interpretation of the reference is the same as in the prior office action.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

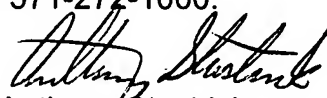
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick Hamo whose telephone number is 571-272-3492. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Stashick can be reached on 571-272-4561. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



PH



Anthony Stashick
Supervisory Patent Examiner
Art Unit 3746